CLAIMS

1.   A method for estimating a system state that is applied in a network comprising a plurality of nodes, each node having means for receiving and sending information and means for processing information, and each node being connected to selected other nodes of the network, the method comprising, at each node:

(i) maintaining a set of particles and associated weights, which represent an estimate of the system state,

(ii) representing the estimated system state as a mixture of Gaussian distributions, and communicating said mixture to neighbouring nodes, and

(iii) in response to receiving said mixture from a neighbouring node, updating the estimate of the system state that is maintained at the node.

2.   A method according to claim 1, wherein said updating, at each node, is carried out by resampling the particles comprising providing new weights for each particle comprising a said mixture of Gaussian distributions received from a neighbouring node, divided by a said mixture of Gaussian distributions formed from the existing particle set in the node.

3.   A method according to claim 1 or 2, wherein each Gaussian distribution of said mixture is transmitted as signals representing the mean and covariance of the distribution.

4.   A method as claimed in any preceding claim, including providing channel filters at each port of each node, in which updated weights for each particle are determined.

5.   A network for estimating a system state, the network comprising a plurality of nodes, each node having means for receiving and sending information and means for processing information, and each node being connected to selected other nodes of the network, each node including:

particle filter means for maintaining a set of particles and associated weights, which represent an estimate of the system state, and means for updating the set when new information is available,

means for representing the estimated system state as a mixture of Gaussian distributions, and means for communicating said mixture to neighbouring nodes,

said means for updating, being responsive to receiving said mixture from a neighbouring node, for updating its estimate of the system state.

6. A network as claimed in claim 5, wherein a communication port of each node includes a channel filter.

7. A network as claimed in claim 6, wherein said channel filter is operative to compute new weights for each particle in a resampling operation, the new weights comprising said mixture of Gaussian distributions communicated to the node, divided by said mixture of Gaussian distributions representing the exisiting particle set at said node.

8. A network as claimed in claim 5, 6, or 7, wherein said means means for communicating is operative to transmit each Gaussian distribution of said mixture as signals representing the mean and covariance of the distribution.

9. A network as claimed in any of claims 5 to 8, wherein each node is a sensor for tracking aircraft.

10. A network as claimed in claim 5 and substantially as described with reference to the accompanying drawings.

11. A method as claimed in claim 1 and substantially as described with reference to the accompanying drawings.